AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-6 (canceled).

Claim 7 (currently amended): An electromagnetic field analyzer comprising:

dividing means for dividing form data as an analysis object into coarse elements and fine elements;

forming means for forming a matrix defining an electromagnetic field vector of the coarse elements divided by the dividing means related to an electromagnetic field vector of the fine elements; and

calculating means for calculating an approximate solution of the electromagnetic field vector of the fine elements by applying an iteration method of simultaneous linear equations while referring to the matrix formed by the forming means; wherein

the forming means forms the matrix by expressing the elements of electromagnetic field vectors at the sides at a fine element using an interpolation function in the coarse elements; and

when the length of a side l_i of the fine element is $|l_i|$, an interpolation function showing a relationship between the electromagnetic field at position x of the side l_i of the fine element and the electromagnetic field at a side j of the coarse element is N_j^C (x), and the tangential vector of the side l_i of the fine element is t_i, the forming means forms a matrix P_{ij} by using the following expression:

$$P_{ij} = \frac{1}{|l_i|} \int_{l_i} N_j^C(x) \cdot t_i dl \qquad \cdots (14)$$

Claims 8 and 9 (canceled).

Claim 10 (previously presented): An electromagnetic field analyzer according to claim 7, wherein, in the calculating means, the accuracy of an approximate solution of the electromagnetic field vector of the fine elements is improved such that high-frequency components included in the approximate solution of the electromagnetic field vector of the fine element are removed by applying a stationary iteration method of simultaneous linear equations, such that a residual in the fine elements is mapped to a residual in the coarse elements by using the matrix formed by the forming means, such that a correction vector to the coarse elements is formed by applying a direct method or a non-stationary iteration method of simultaneous linear equations, and such that a correction vector to the fine elements is obtained by using the matrix formed by the forming means.

Claim 11 (currently amended): A computerized method of controlling a computer to analyze an electromagnetic field as an analysis object, wherein the computer includes a first storage device arranged to store divided elements and a second storage device arranged to store a matrix and a display arranged to display a solution, the computerized method comprising the steps of:

dividing form data as an analysis object into coarse elements and fine elements and storing the elements in the first storage device;

forming a matrix defining an electromagnetic field vector of the coarse elements stored in the first storage device related to an electromagnetic field vector of the fine elements and storing the matrix in the second storage device;

calculating an approximate solution of the electromagnetic field vector of the fine elements by applying an iteration method of simultaneous linear equations while referring to the matrix stored in the second storage device; and

displaying the approximate solution obtained in the calculating step; wherein the step of forming forms the matrix by expressing the elements of electromagnetic field vectors at the sides at a fine element using an interpolation function in the coarse elements; and

when the length of a side l_i of the fine element is $|l_i|$, an interpolation function showing a relationship between the electromagnetic field at position x of the side l_i of the fine element and the electromagnetic field at a side j of the coarse element is N_j^C (x), and the tangential vector of the side l_i of the fine element is t_i, the forming means forms a matrix P_{ij} by using the following expression:

$$P_{ij} = \frac{1}{|l_i|}\int_{l_i} N_j^C(x)\cdot t_i dl \qquad \cdots (14)$$

Claims 12 and 13 (canceled).

Claim 14 (previously presented): A computerized method according to claim 11, wherein, in the step of calculating, the accuracy of an approximate solution of the electromagnetic field vector of the fine elements is improved such that high-frequency components included in the approximate solution of the electromagnetic field vector of the fine element are removed by applying a stationary iteration method of simultaneous linear equations, such that a residual in the fine elements is mapped to a residual in the coarse elements by using the matrix formed by the step of forming, such that a correction vector to the coarse elements is formed by applying a direct method or a non-stationary iteration method of simultaneous linear equations, and such that a correction vector to the fine elements is obtained by using the matrix formed by the step of forming.

Claim 15 (currently amended): A computer-readable storage medium having stored thereon a program to control a computer to execute an electromagnetic field analyzing method for analyzing an electromagnetic field as an analyzing object, wherein the computer includes a first storage device arranged to store divided elements and a second storage device arranged to store a matrix, the electromagnetic field analyzing method comprising the steps of:

dividing form data as an analysis object into coarse elements and fine elements and storing the elements in the first storage device;

forming a matrix defining an electromagnetic field vector of the coarse elements stored in the first storage device related to an electromagnetic field vector of the fine elements and storing the matrix in the second storage device; and

calculating an approximate solution of the electromagnetic field vector of the fine elements by applying an iteration method of simultaneous linear equations while referring to the matrix stored in the second storage device; wherein

the step of forming forms the matrix by expressing the elements of electromagnetic field vectors at the sides at a fine element using an interpolation function in the coarse elements; and

when the length of a side l_i of the fine element is $|l_i|$, an interpolation function showing a relationship between the electromagnetic field at position x of the side l_i of the fine element and the electromagnetic field at a side j of the coarse element is N_j^C (x), and the tangential vector of the side l_i of the fine element is t_i, the forming means forms a matrix P_{ij} by using the following expression:

$$P_{ij} = \frac{1}{|l_i|} \int_{l_i} N_j^C(x) \cdot t_i dl \qquad \cdots (14)$$

Claims 16 and 17 (canceled).

Claim 18 (previously presented): A computer-readable storage medium according to claim 15, wherein, in the step of calculating, the accuracy of an approximate solution of the electromagnetic field vector of the fine elements is improved such that high-frequency components included in the approximate solution of the electromagnetic field vector of the fine element are removed by applying a stationary iteration method of simultaneous linear equations, such that a residual in the fine elements is mapped to a residual in the coarse elements by using the matrix formed by the step of forming, such that a correction vector to the coarse elements is formed by applying a direct method or

a non-stationary iteration method of simultaneous linear equations, and such that a correction vector to the fine elements is obtained by using the matrix formed by the step of forming.